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Maria Eliseeva
Suite 4
4 Militia Drive
Lexington, MA 02421

EXAMINER	
CHANG, AUDREY Y	
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2872	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/772,752	WOONTNER, MARC O.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *7-10 and 12-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 11 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on November 23, 2009, which has been entered into the file.
- By this amendment, the applicant has amended claims 1-3, 5, 6, 11 and 15. The amendment to claim 5 is improper for lacking to underline the newly added feature.
- Claims 7-10 and 12-14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention group, there being no allowable generic or linking claim. Election was made **without traverse** in the reply filed on May 9, 2005.
- Claims 1-6, 11 and 15 remain pending in this application.
- The rejections of claims under 35 USC 112, second paragraph, are withdrawn in response to applicant's amendment.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claim 5 is rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 has been amended to recite the phrase "each of angles encodes a number for subsequent reading" that is confusing and indefinite. It is not clear how could the "angle" encodes a number. The angle is a **measurement** of the diffracted beam with respect to certain reference axis. If the reference axis changed, the numerical value of the angle will also change, which means the angle value is not absolute. The angle therefore is a number itself and it cannot encode any other number. It is therefore not clear how could the numerical value of the angle encodes a number.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 5-6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Rice (PN. 5,396,839).

Claims 1 and 11 have been amended to necessitate the new grounds of rejection.

Rice teaches a multi-layer structure for forming an image, (please see Figures 1, 7, and 14 and columns 8-9) that is comprised of an embossed layer (55, in Figures 8-11, 115, in Figure 16, or 146, in Figure 18) and a printing stock. The printing stock (22) as shown in Figures 1 and 14, comprises a surface layer (23) and a stock (22), wherein the stock (22) serves as the substrate. The structure further comprises a plurality of pixels or panels (51, Figure 7 or 152, Figure 19, column 14, lines 49-52) that is embossed with different diffraction gratings (56, the designations of "8", "9" and "10" in Figure 7 referred to different embossed diffraction gratings as shown in Figures 8, 9 and 10), respectively, wherein each of the diffraction gratings is capable of diffracting and reflecting one of the primary colors, (please see column 8, lines 49-63). The plurality of panels is *tinted with ink* (54), wherein the ink may include one of the primary colors (please see column 7, lines 45-50). As shown in Figure 7, Rice teaches the diffraction gratings embossed on the embossable layer are capable of diffracting and reflecting red, blue or green colors. By arranging the individual diffraction gratings in certain combination, Rice further teaches that additive effect can be achieved so that by arranging different combinations of the embossed diffraction gratings in a pixel or panel, for instance with equal sized ink dots (55) embossed to separately diffract blue and red color would reflect the color magenta, (please see column 9, lines 30-43). Rice also teaches that the ink (54) is applied to the printing plate (31) to create half-tone images, which become the

composite image (48), where the ink may include various color such as yellow, magenta and cyan, (please see column 5, line 30-40). The ink (54) is then pressed onto surface layer (23) of the printing stock (22, Figure 1) together with the embossed layer that is comprised of the embossed diffraction gratings, to form the plurality of pixels or panels.

This reference has met all the limitations of the claims. With regard to the feature concerning each individual panel is to diffract incoming light at a predetermined reflection angle, Rice teaches explicitly that the diffraction gratings are embossed by using mold and the diffraction pattern on the mold is formed by holographic method, (please see column 10, lines 21-40). This means that the diffraction gratings are holographically configured. The diffraction gratings would diffract the incident light to form spectra of light. By viewing the spectra of light produced by the diffraction grating at *different range of angle* different wavelengths or colors of light can be seen, (please see column 8, lines 49-54). This means that the diffraction grating would diffract different color of light at different range of angles, based on the fundamental theory of the diffraction grating. The diffraction gratings designed to diffract and reflect red color (R) would fundamentally have different **ranges** of the diffraction angle than the diffraction grating designed to diffract blue or green color of light. Since Rice does teach explicitly that according to the diffraction theory a diffraction grating **inherently** diffracts and reflects incoming light into beams of *spectra*, which means different color of light will be diffracted and observed at a *different* angle rang and the angle of diffraction and reflection of the incoming light for the diffraction grating is determined by the grating structures such as the pitches and orientations of the grating grooves, (please see column 8 line 59 to column 9, line 18), it would then have been obvious to one skilled in the art, *if this is not already of the case* for the structure of Rice, to design and make the panels to diffract different color of light with different diffraction angle and therefore the reflection angle for the benefit of allowing different color effect and decorative appearance be observed at different viewing angle.

Claims 1 and 11 have been amended to include the phrase of "substantially non-overlapping panels". The panels or pixels (51) are substantially non-overlapping to each other as shown in Figure 7.

Claims 1 and 11 have further been amended to include the phrase that at least two panels are tinted with different primary colors. Rice teaches as shown in Figure 7, at least two pixels or panels are tinted with different color such as red, blue or green, (i.e. R, G. B shown in Figure).

With regard to claim 3, the ink dots embossed with the same diffraction grating can be grouped together as the "panel".

With regard to claim 5, the scopes of the claim are not clear. It is not clear how does the diffraction angle is capable of *encoding* a number. It is true that the diffraction angle for different color of light will be different based on the diffraction theory.

The same reasons of rejection above are applied to claim 11.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Rice as applied to claim 1 above, and further in view of the patent issued to Mallik et al (PN. 5,085,514).

The multi-layer structure for forming an image taught by Rice as described for claim 1 above has met all the limitations of the claim. This reference however does not teach explicitly to include the claimed layers. Mallik et al in the same field of endeavor teaches a layer structure for making replication of embossed microstructure wherein the layer structure include a web (111, Figure 11) serves as the thermal stable layer, a strip coating (197) serves as the wear resistant layer, an embossable layer (199) with embossed microstructure, a reflective layer (201) for overlaying the embossable layer and an adhesive layer (203) which is heat activated to adhere the multi-layer structure to a substrate (205, Figure 12, please see column lines 23-40). It would then have been obvious to one skilled in the art to apply the teachings of the layer structure of Mallik et al to modify the multi-layer structure of Rice to provide wear-

resistant protection as well as adhesive means to make the multi-layer structure with image formed easily attached to desired substrate agent.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Rice (PN. 5,396,839).

Claim 15 has been amended to necessitate the new grounds of rejection.

Rice teaches a material or structure for forming an image, (please see Figure 7, columns 8-9) that is comprised of a plurality of ink dots (55, Figure 7), serves as the *holographic pixels*, each dot is being embossed with a diffraction grating (56) that is capable of diffracting and reflecting incoming light in a predetermined diffraction angle, (please see Figure 7, columns 8-9). Rice teaches that the ink dots comprise ink (54) that includes one of the primary colors, (please see column 7, lines 45-50). Rice teaches that the ink dots having the embossed diffraction grating are applied to a printing stock (22, Figures 1, and 8-10), wherein the printing stock comprises a surface layer (23) and a stock (22), wherein the stock (22) serves as the substrate.

Rice teaches explicitly that the diffraction gratings are embossed by using mold and the diffraction pattern on the mold is formed by holographic method, (please see column 10, lines 21-40). This means that the diffraction gratings are holographically configured and the pixels are holographic pixels.

Rice teaches that the diffraction grating is capable of diffracting and reflecting the incident light to produce spectra. The spectra of light is produced by diffraction of grating at different ranges of angles. This means different color of light can be viewed at different range of angles, (please see column 8, lines 49-63). This means the diffraction gratings for diffracting different primary color of light is diffracting the color light at different ranges of angles.

Claim 15 has been amended to include the phrase that all pixels of the same color diffracting light at a diffraction angle different for each primary color. Based on the fundamental diffraction theory stated above, the holographic pixels for different color does diffract the different color of light into different ranges of angles. Furthermore, since Rice does teach explicitly that the angle of diffraction and reflection of the incoming light for the diffraction grating is determined by the grating structures such as the pitches and orientations of the grating grooves, (please see column 8 line 59 to column 9, line 18), it would then have been obvious to one skilled in the art, *if this is not already of the case* for the structure of Rice, to design and make the panels to diffract different color of light with different diffraction angle and therefore the reflection angle for the benefit of allowing different color effect and decorative appearance be observed at different viewing angle.

Claim 15 has further been amended to include the phrase at least two pixels are tinted with different primary colors, Rice teaches that at least two pixels (51) are being tinted (using ink 54) with different primary colors such as red, green or blue, (R,G, B as shown in Figure 7).

7. Claims 1-6, and 11 and newly amended claim 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Waitts (PN. 5,834,096) in view of the patent issued to Rice.

Claims 1, 11 and 15 have been amended to necessitate the new grounds of rejection.

Waitts teaches a card (10) serves as the multi-layer material that is comprised of an embossable layer (32, Figures 1-3) and a base support (26, Figures 2-3) serves as the substrate, (please see column 3, lines 58-62). The embossable layer has a microtextured surface (34, Figures 2-3 and column 3, lines 63-64), and the microtexture represents the interference fringe of reflection hologram, that exhibits 2D or 3D effects (please see column 3, line 65 to column 4, line 4 and column 5, lines 12-14) which therefore provides *diffraction grating pattern* (16, please see Figures 1-3, column 3, lines 26-30), in the card or the

multi-layer material. Waitts teaches that the diffraction grating pattern (16) can provide 3D holographic indicia with different 3D effects (18, 20 and 23, Figure 1). As shown in Figure 1, the different holographic indicia (18, 20 and 23) are reproduced at *different viewing angles* or positions, it therefore implies that there are more than one different diffraction grating patterns or holograms (one for each different holographic indicia, based on fundamental theory of the hologram, also see column 3, lines 24-26 the plural form of the "holograms") and each of the diffraction grating patterns reproduces the corresponding holographic indicia would diffract incoming light at a predetermined and different diffraction/reflection angles. Although this reference does not teach explicitly that the embossing layer comprises a plurality panels, one certainly can identify each different diffraction grating pattern for reproducing the different holographic indicia (18, 20 and 23) be contained within a different panel. The card or the multi-layer material having more than one different holographic indicia therefore implicitly comprises more than one panel, (please see column 3, lines 11-65).

Waitts further teaches that the embossable layer can be tinted, (please see column 5, lines 1-6). This reference however does not teach explicitly that the tint color is one of the primary color. **Rice** in the same field of endeavor teaches printing method for making color image wherein different color pigments including primary colors can be used to create different color effect., (please see column 1, lines 58-62, column 5, and lines 30-40). Rice further teaches that different color ink can be applied to different ink dots (55, Figure 7) having diffraction grating (56) embossed upon. It would then have been obvious to one skilled in the art to select one of the primary color such as yellow-magenta-cyan-black color as the tint color to tint different holograms or diffraction patterns (therefore different panels) for the benefit of creating the desired decorative effects.

Claims 1 and 11 have been amended to include the phrase of "substantially non-overlapping panels". The different holographic diffraction gratings (16 and 23) can be viewed as substantially non-overlapping panels.

Waitts teaches that the diffraction grating pattern comprises embossed reflection holograms that reproduce different 3D holographic images or indicia (18 and 20) that are viewable at different angle and different viewing positions, (please see Figure 1 and column 3, lines 24-30), this means that the different holograms for reproducing the different holographic images are in different panels and are holographically and optically variably configured.

With regard to claim 4, Waitts teaches that the multi-layer material further comprises a heated pressed plate (38, Figure 3) serves as the thermally stable layer, a scuff coat (36) serves as the wear resistant layer or top coat, a reflective layer (30) overlaid the embossed layer (32) and adhesive layer (28) that serves to attach the material to a substrate (26, Figure 3, column 4). Although this reference does not identify explicitly that the adhesive is heat activated however heat activated adhesive such as epoxy resin is very well known and well used in the art such modification would have been obvious to one skilled in the art for the benefit of using common adhesive to achieve the adherence purpose with less cost and good adhesive quality.

With regard to amended claim 5, one can certainly arbitrarily assign a number to different angles of diffraction for the panels.

The same reasons for rejections are applied to claims 11 and newly amended claim 15.

Response to Arguments

8. Applicant's arguments filed on November 23, 2009 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and they are rejected for the reasons stated above.

9. In response to applicant's arguments which state that none of the cited references mention of "each diffraction angle appearing only on identically colored surface" which therefore differs from the instant application, the examiner respectfully disagrees. Since firstly, such phrase is not explicitly recited in the claims and secondly such phrase is not making any physical sense. The diffraction angle,

determined by the diffraction theory, is a function of the wavelength of the light and the pitch of the diffraction grating. For different wavelength or color of light the diffraction angle would be different as taught by Rice explicitly to produce spectra of diffracted light. The diffraction angle also is a *measurement* of diffracted light with respect to a reference axis and it cannot be "appearing on the surface". This phrase therefore is wrong and the arguments based on the statement do not overcome the rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (9:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Audrey Y. Chang, Ph.D.

/Audrey Y. Chang/
Primary Examiner, Art Unit 2872